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**B65D 21/06**

(52) UK CL (Edition T )

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**GB 2296009 A**

**GB 2263689 A**

**US 4573577 A**

(58) Field of Search

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(54) Abstract Title

**Open topped container capable of nesting and stacking**

(57) An open topped container 1 capable of deep and shallow nesting and column stacking, comprises a base 2, a plurality of side walls 3, 4, and two end walls 5, 6, each end wall including at least one support formation 22 that extends outwards from the external face of that wall, adjustable support means 28, 29 extending substantially parallel to the associated end wall, each support means including a substantially U-shaped bar 30, and two legs 33 that depend from the bar 30 and engage in mounts 17 in the side walls so to allow selective adjustment between three positions. The three positions may all be located substantially in the plane of the open top of the container 1, and the mounts 17 may be provided by inverted U-shaped formations and the legs 33 may include pivot members 34 engaged in the mounts 17. Locking formations may be provided for retaining the bar 30 in a chosen position, the locking formations may be provided by rebates 14 provided in the side walls. The support formations 22 may be provided by buttress structures and may provide corresponding open-topped recesses 22a on the inner faces of the end walls. A flange 18 may be included to engage the upper edges of the corresponding walls of an underlying container when deeply nested, and channels or rebates may be provided to engage with lugs 35 provided on the bars 30 of an underlying container.

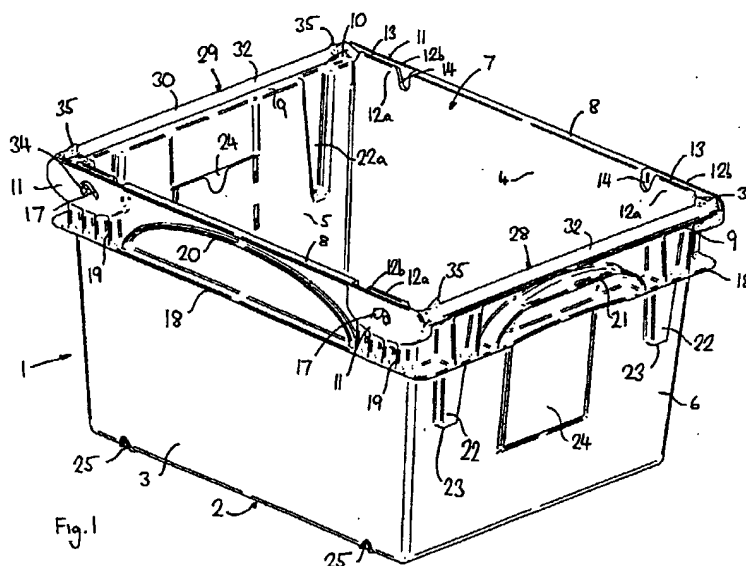


Fig. 1

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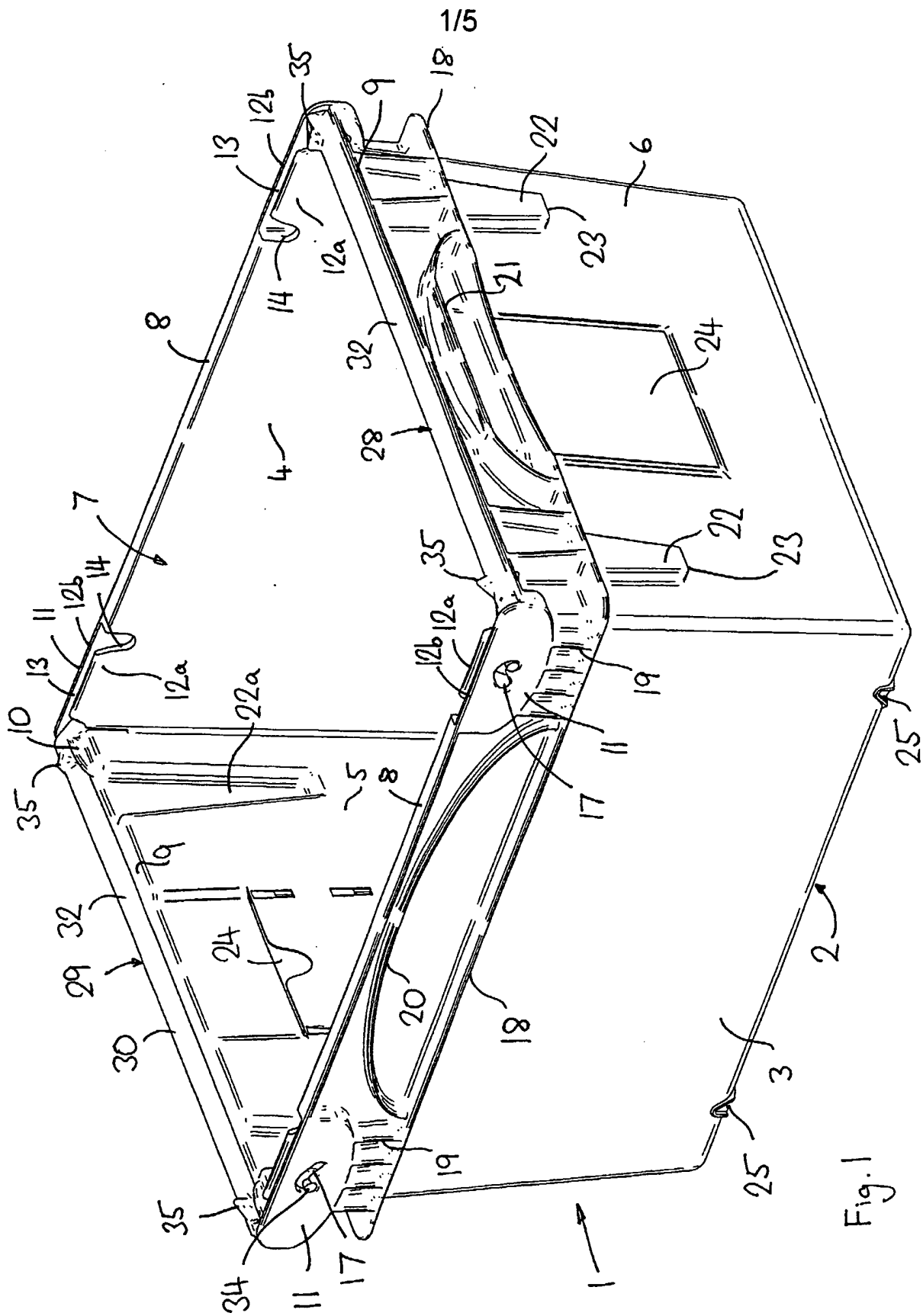
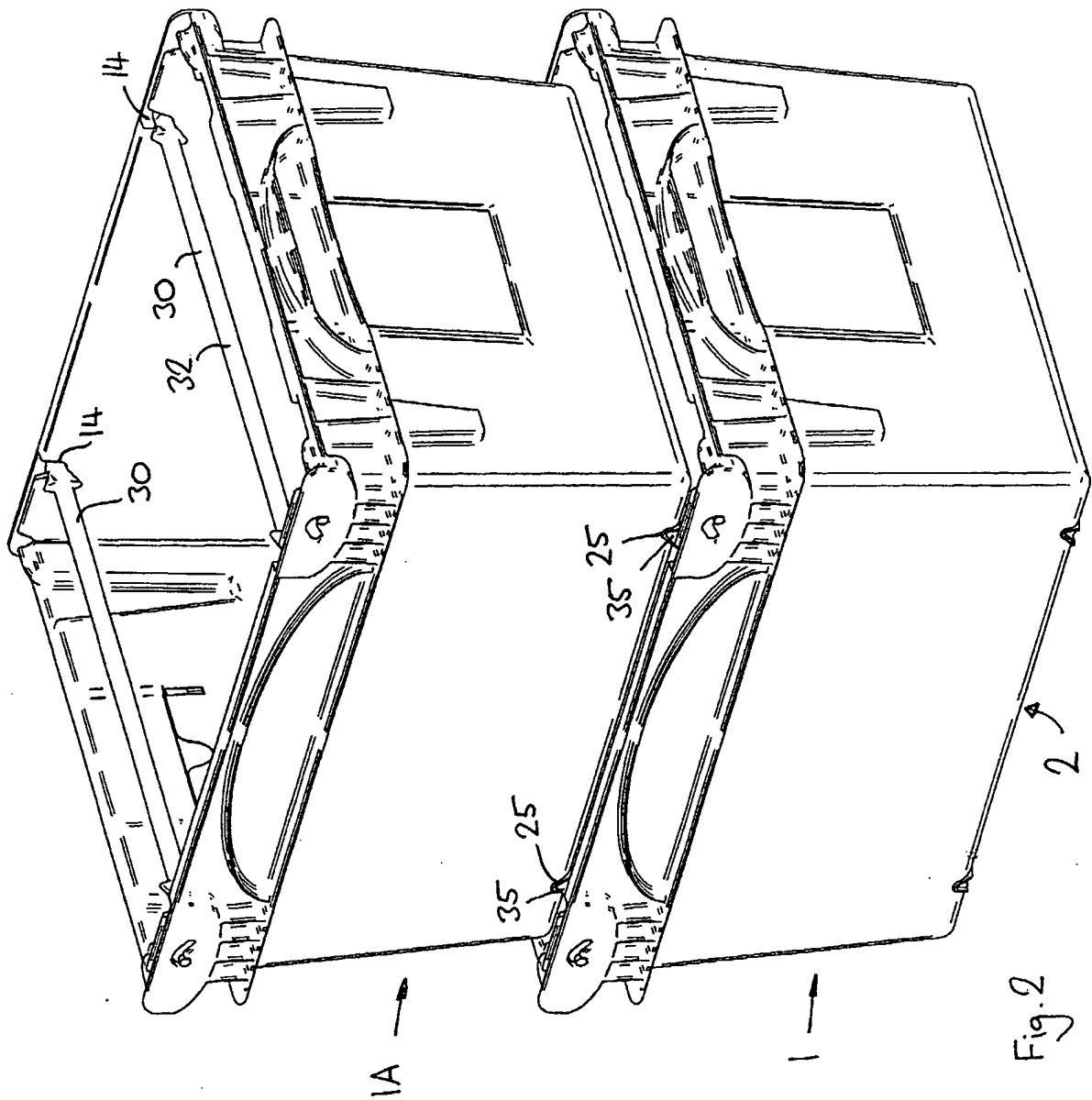
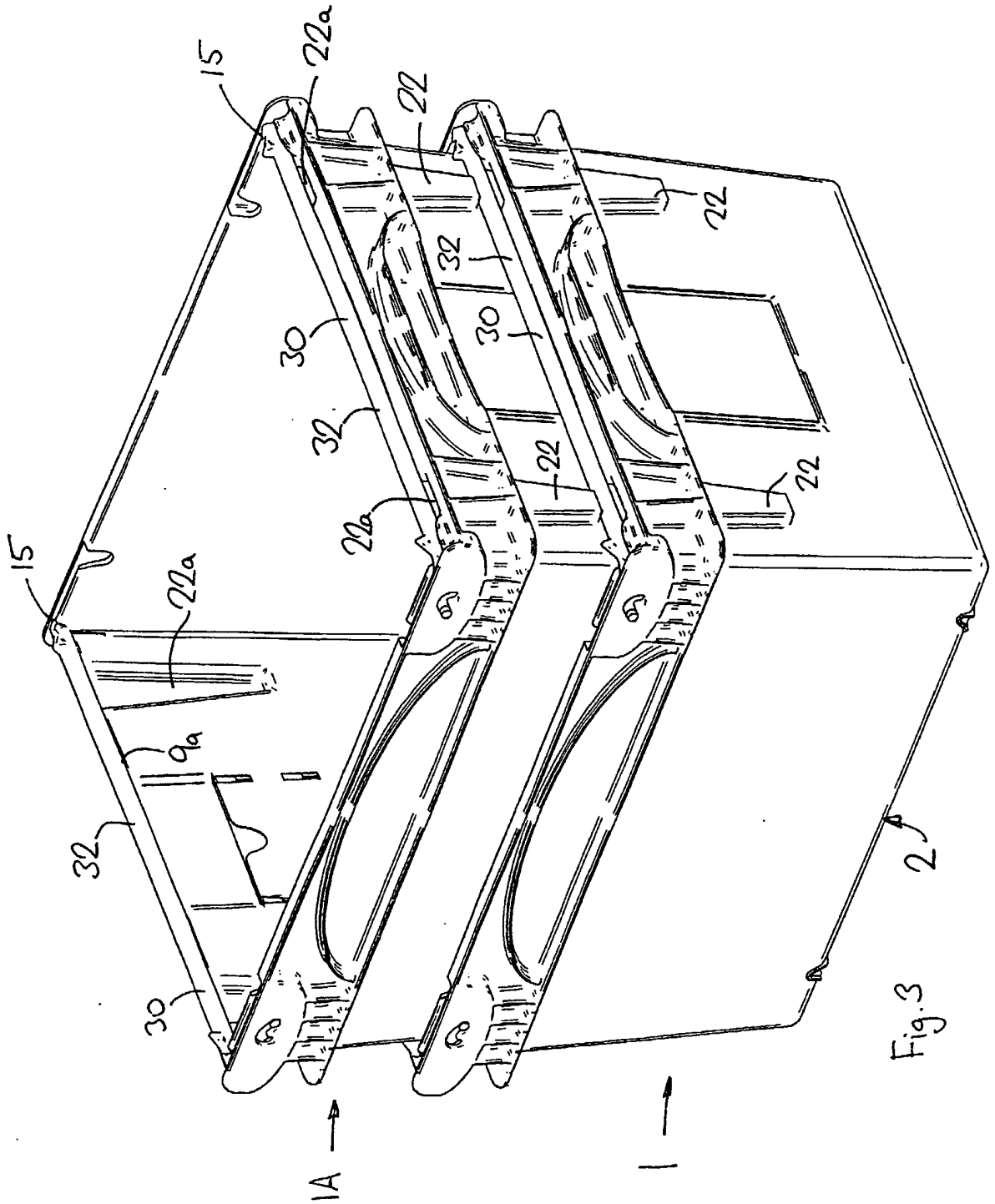
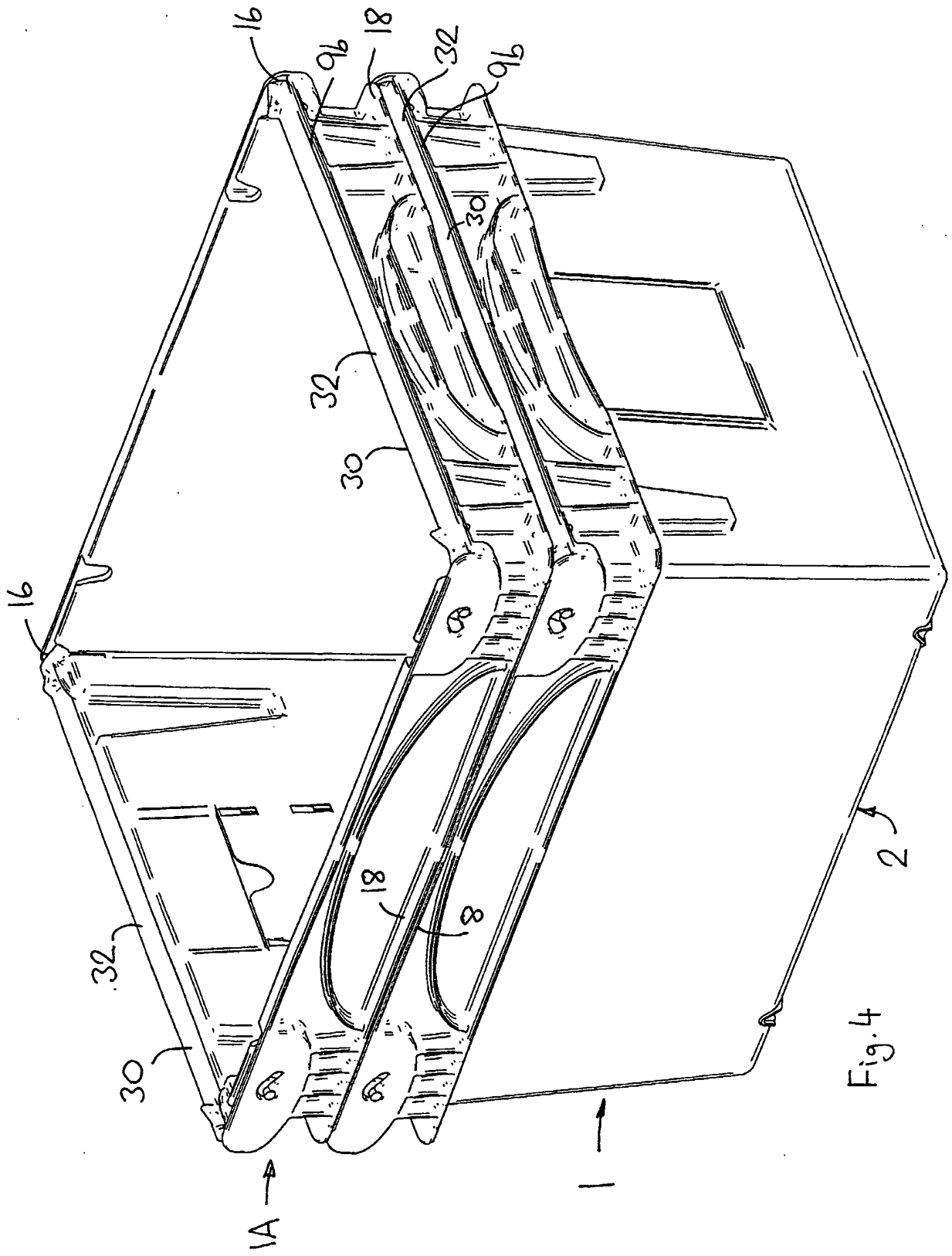


Fig. 1







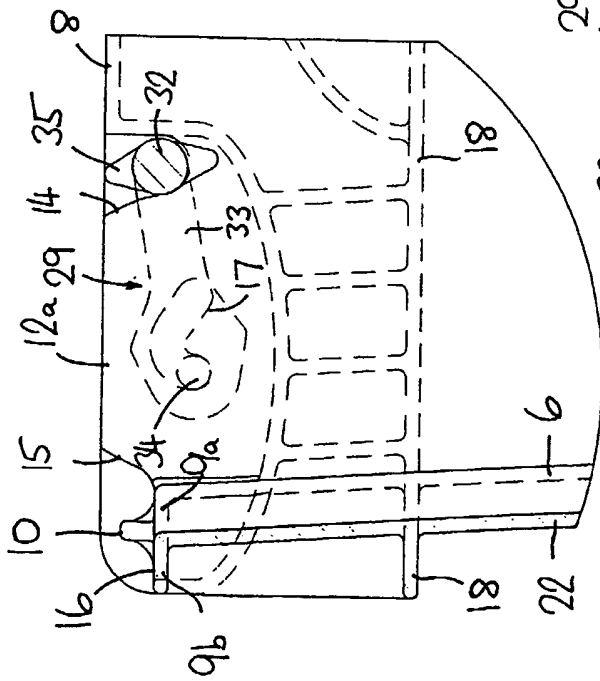


Fig. 5

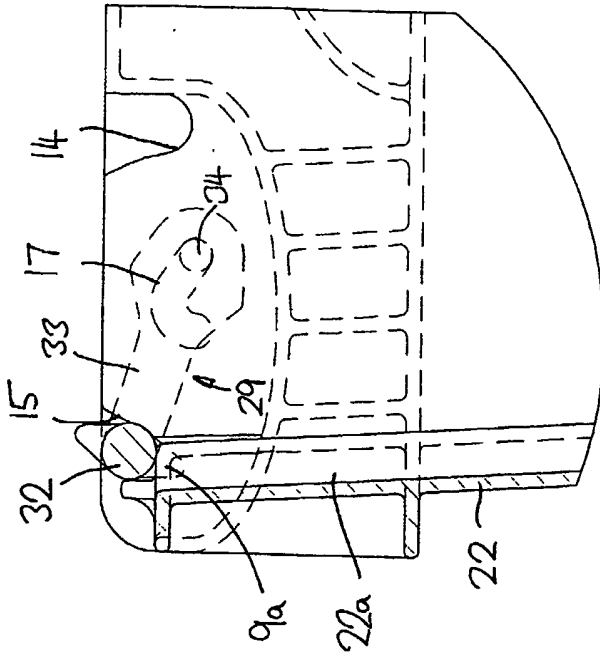


Fig. 6

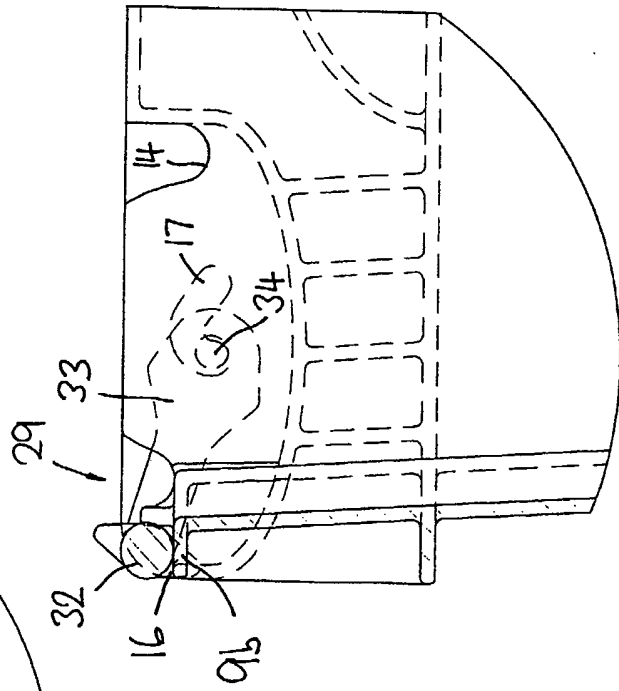


Fig. 7

**AN OPEN TOPPED CONTAINER**

The present invention relates to an open topped container. In particular, but not exclusively, it relates to an open topped container that can be assembled with several similar containers to form a vertical column in either a deeply nested condition (where an  
5 overlying container is partly received within the container that underlies it so that the bases of adjacent nested containers are relatively close together), or a shallow nested condition (in which an overlying container is partly received within the underlying container and the spacing between the bases is greater than when the containers are fully nested), or a stacked condition (in which adjacent containers in the column are supported so that their bases are  
10 relatively widely spaced).

More particularly, the invention concerns open topped containers having pivotally-mounted supports such as bars that are associated with the open top to extend between opposed side walls of the containers and are adjustable to a first position in which the supports are located and retained to support the base of an overlying container in a column stacked or  
15 un-nested condition, a second position in which the supports are located to support an overlying container in a shallow nested condition, and a third position in which they provide clearance through the open top for a similar container to be received in a deeply nested condition. An example of an open topped container capable of column stacking and nesting in shallow and deeply nested conditions by the use of pivotal bars is disclosed in  
20 GB 2 263 689.

The advantages of containers that are capable of deep and shallow nesting and column stacking are well known in the art. Principally these are that the containers when empty can be assembled as a vertical column in a deeply nested condition to minimise the space occupied by the containers (as is desirable for storage and transport), the containers when  
25 full can be stacked as a vertical column (which is again convenient for storage and transport) while the base supports ensure that the contents of a container will not be compressed or otherwise damaged by overlying containers, while if the containers contain only a small quantity of goods, the containers can be stacked in a shallow nested condition, providing a considerable saving in space as compared to the column stacked condition.

A disadvantage of the known containers of this latter type is that the movement of the base supports between the three positions is relatively complicated and adjusting the supports between those positions is therefore inconvenient. It is an object of the present invention to provide an open topped container that mitigates this disadvantage.

5 According to the present invention there is provided an open topped container including a base, a plurality of side walls and a plurality of end walls that extend upwards from the base, each end wall including at least one support formation that extends outwards from the external face of that wall, and wherein associated with each end wall of the container there is provided an adjustable support means for supporting a second similar container on top  
10 of the first container in a stacked formation, each said support means including a substantially U-shaped support member comprising an elongate bar that extends substantially parallel to the associated end wall and two legs that depend from the bar and are engaged in mounts in the side walls so as to allow selective adjustment of the bar between first, second and third positions, the support means being constructed and arranged  
15 such that when the bar is located in the first position it overlies the base and is arranged to support a second similar container in a column stacked formation, when the bar is located in the second position it overlies the or each support formation of the associated end wall and is arranged to support a second similar container in a shallow nested condition, and when the bar is located in the third position it overlies neither the base nor the support  
20 formations, thereby allowing a second similar container to be stacked in a deeply nested condition.

The container is capable of being stacked in column stacked, shallow nested and deeply nested conditions, and the support means is easily adjusted between the positions required to allow stacking in those different conditions. The container is therefore very easy and  
25 convenient to use.

Advantageously, said first, second and third positions of the bar are all located substantially in the plane of the open top of the container. Advantageously, the second position of the bar is located between said first and third positions.

Advantageously, the mounts include inverted U-shaped formations and the legs include  
30 pivot members engaged in said formations for pivoting and sliding movement therein. The



formations may, for example, comprises slots in the side walls of the container. By pivoting the pivot members and sliding them to opposite ends of the formations, the support members may be adjusted very easily between the different support positions

Advantageously, container includes locking formations for retaining the bar in said first, 5 second and third positions. The locking formations may include rebates provided in the side walls.

Advantageously, the support formations include buttress structures that extend upwards towards the upper edges of the end walls. The support formations preferably provide corresponding open-topped recesses on the inner faces of the end walls. The sides of each 10 recess are preferably inclined to accommodate the support formation of an overlying container when the containers are stacked in a deeply nested condition.

Advantageously, the container includes a flange that extends outwards from the side and/or end walls of the container, to engage the upper edges of the corresponding walls of an underlying container when the containers are stacked in a deeply nested condition.

15 The container preferably includes channels or rebates on the underside of the base member, for engagement with the bars of an underlying container when the containers are stacked in a column stacked formation. Preferably, the support members include lugs that engage the channels or rebates of an overlying container when the containers are stacked in a column stacked formation.

20 An embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is an isometric view of a container according to the invention;

Figure 2 is an isometric view showing two containers in a column stacked condition;

Figure 3 is an isometric view showing two containers in a shallow nested position;

25 Figure 4 is an isometric view showing two containers in a deeply nested condition;

Figure 5 is a scrap section showing a support bar in a first position;

Figure 6 is a scrap section showing a support bar in a second position; and

Figure 7 is a scrap section showing a support bar in a third position.

The container 1 has a generally horizontal flat oblong rectangular base 2 upstanding from which are opposed longer side walls 3 and 4 and opposed end walls 5 and 6 which extend between the side walls. Usually the base and walls are formed as a plastics moulding. The walls 3 to 6 are inclined to diverge outwardly as they approach and form a rectangular open top 7 within which can be located the base and lower portions of the walls of a similar overlying container (indicated in some Figures at 1A) to provide nesting in the erection of the vertical column in known manner.

- 10 The upper edges of the side walls 3,4 are turned outwards, forming side rims 8. The upper edges of the end walls 5,6 are also turned outwards forming end rims 9, which are slightly lower than the side rims 8. Each end rim includes an inner portion 9a and an outer portion 9b, the inner and outer portions being separated at each end of the end wall by a short dividing lug 10.
- 15 At each end of each side wall 3,4, adjacent the upper edge of that side wall, there is provided a doubled walled section 11, comprising an inner wall 12a and an outer wall 12b. Those walls 12a,12b are separated by a slot 13 that opens between the upper edges of the walls. A first rebate 14 is provided in the inner wall 12a at the inner end of the slot 13, and second and third rebates 15,16 respectively are provided at the outer end of that slot, in line
- 20 with the inner and outer portions 9a,9b of the end rim 9. An inverted U-shaped slot 17 is provided in the outer wall 12b.

A support flange 18 extends outwards from the walls 3 to 6 at approximately three quarters the height of the container. The support flange 18 and the rims 8,9 are supported by vertical ribs 19 that extend between the flange and the rims. Curved flanges 20,21 are

- 25 provided on the side walls 3,4 and the end walls 5,6 respectively, between the flange 18 and the rims 8,9. The curved flanges provide handles for lifting the container.

Outwardly extending buttresses 22 are provided on the end walls 5,6, forming corresponding recesses 22a in the inner faces of the end walls, which open upwards through the inner portion 9a of the end rim. The lower ends 23 of the buttresses 22 are at

approximately half the height of the walls 5,6. The sides of the buttresses 22 are inclined outwards, allowing the buttresses of a second similar container to be accommodated within the recesses 22a of an underlying container, when the containers are stacked in a deeply nested condition.

- 5 In a conventional manner, label-receiving slots 24 are provided in the end walls 5,6 and channels or rebates 25 are provided on the lower surface of the base 2.

Extending between the opposed side walls 3,4 are two support means indicated at 28,29 which are located, one each, towards the longitudinally opposite ends of the container. The support means 28,29 are constructed in an identical manner to each other and serve a  
10 similar purpose. For convenience therefore the means 29 need only be described.

The support means 29 consists of a metal or plastics support bar 30 which has a straight back portion 32 and two leg portions 33. The support bar 30 has its leg portions 33 pivotally mounted by means of short pivot pins 34, which are engaged in the slots 17 in the side walls 12b. The pivot pins 34 can slide between the inner and outer ends of the slots  
15 17 and the bar 30 can pivot about an axis extending through the pivot pins 34. The back portion 32 can thus be positioned in the first rebate 14 (as shown in Figures 2 and 5) or in the second rebate 15 (as shown in Figures 3 and 6), or in the third rebate 16 (as shown in Figures 4 and 7). Stop lugs 35 are provided at each end of the back portion 32.

With the two support bars 30 in the first rebates 14 it will be seen, particularly from Figures  
20 2 and 5, that the back portions 32 will overlie the base 2. In particular, at both ends of the container, the back portions 32 overlie the channels or rebates 25 on the underside of the base 2.

Alternatively, when the support bars 30 are pivoted for their back portions 32 to be seated in the second rebates 15, it will be seen from Figures 3 and 6 that the back portions are out  
25 of overlying relationship with the base 2 and are instead located above the inner portions 9a of the end rims. The back portions 32 thus cover the open upper ends of the buttress recesses 22a and overlie the lower ends 23 of the buttresses.

When the support bars 30 are positioned with their back portions 32 seated in the third rebates 16, it will be seen from Figures 4 to 7 that the back portions of the respective

support bars are out of overlying relationship with the base 2, and are located above the outer portions 9b of the end rims.

It will be apparent from Figures 2 and 5 that when the two support bars 30 are pivoted so that they are supported on the first rebates 14, their back portions 32 extend across the open top of the container in the general plane of that top opening so that a second similar container 1A can be column stacked with its base 2 standing on the back portions of the support bars 30. Such column stacking permits a major part of the container to be available for receiving goods to be stored or transported whilst alleviating the likelihood of such goods being damaged or crushed by loading from an overlying container in the erection of a column of containers.

In accordance with conventional practice, the channels or rebates 25 provided on the underside face of the base 2 receive and provide firm engagement with the back portions 32 of the support bars of a similar underlying container on which the base sits. The stop lugs 35 engage the ends of the rebates 25 to prevent the overlying container sliding along the support bars of the underlying container.

By pivoting the support bars 30 so that the back portions 32 are accommodated in the second rebates 15 as shown in Figures 3 and 6, a second similar container can be lowered through the open top of the underlying container 1 until the buttresses 22 of the overlying container stand on the back portions 32 of the two support bars 30. The base and the lower parts of the walls are thus received within the underlying container to effect nesting in a partially nested or shallow condition. In this latter condition the space available for the storage of goods within the underlying container between the base 2 of that container and the base of the overlying container which is supported by the bars 30 will be less than the previous storage space available for the two containers when column stacked; nevertheless this reduction in space may be adequate for certain purposes and may alleviate unnecessary waste of overall storage space which could result from column stacking.

If the support bars 30 are adjusted so that their back portions 32 are out of overlying relationship with the base 2 with such back portions resting on the third rebates 16 (as indicated in Figures 4 and 7), a second similar container 1A can be received within the open top of the container 1 and lowered to effect nesting in a fully nested or deep condition. In

this latter condition the base of the upper container is at its closest spacing from the base 2 of the underlying container and therefore the underlying container 1 has less space available for the storage of contents than when the upper container is supported in a relatively shallow nested condition. The maximum depth to which the upper container may 5 be received within the underlying container is determined by the support flange 18 on the upper container 1A abutting the side rims 8 and the back portions 32 of the support bars 30, which rest on the outer portions 9b of the end rims of the underlying container.

To provide the required nesting, the upstanding walls 3 to 6 of the container are inclined to converge as they approach the base 2. With the wall and support bar arrangement shown 10 in the drawings, two containers can be assembled as a vertical column in fully nested, 2 or partially nested or column stacked conditions with approximately one quarter of the volume, half the volume and the full volume of the container available for the storage of goods in each of those respective conditions.

Various modifications of the container are possible, some of which will now be described.

15 Instead of two buttresses, more or fewer support formations may be provided at each end of the container. The shape of the support structures may also be altered. The length of the support structures and the position of the flange may be adjusted, to determine the depth of the deeply nested and shallow nested conditions.

## CLAIMS

1. An open topped container including a base, a plurality of side walls and a plurality  
5 of end walls that extend upwards from the base, each end wall including at least one  
support formation that extends outwards from the external face of that wall, and  
wherein associated with each end wall of the container there is provided an  
adjustable support means for supporting a second similar container on top of the  
first container in a stacked formation, each said support means including a  
10 substantially U-shaped support member comprising an elongate bar that extends  
substantially parallel to the associated end wall and two legs that depend from the  
bar and are engaged in mounts in the side walls so as to allow selective adjustment  
of the bar between first, second and third positions, the support means being  
constructed and arranged such that when the bar is located in the first position it  
15 overlies the base and is arranged to support a second similar container in a column  
stacked formation, when the bar is located in the second position it overlies the or  
each support formation of the associated end wall and is arranged to support a  
second similar container in a shallow nested condition, and when the bar is located  
in the third position it overlies neither the base nor the support formations, thereby  
20 allowing a second similar container to be stacked in a deeply nested condition.
2. A container according to claim 1, wherein said first, second and third positions of  
the bar are all located substantially in the plane of the open top of the container.
3. A container according to claim 1 or claim 2, in which the second position of the bar  
is located between said first and third positions.
- 25 4. A container according to any one of the preceding claims, wherein the mounts  
include inverted U-shaped formations and the legs include pivot members engaged  
in said formations for pivoting and sliding movement therein.

5. A container according to any one of the preceding claims, including locking formations for retaining the bar in said first, second and third positions.
6. A container according to claim 5, wherein the locking formations include rebates provided in the side walls.
- 5 7. A container according to any one of the preceding claims, wherein said support formations include buttress structures that extend upwards towards the upper edges of the end walls.
8. A container according to any one of the preceding claims, wherein said support formations provide corresponding open-topped recesses on the inner faces of the  
10 end walls.
9. A container according to claim 8, in which the sides of each recess are inclined to accommodate the support formation of an overlying container when the containers are stacked in a deeply nested condition.
10. A container according to any one of the preceding claims, including a flange that  
15 extends outwards from the side and/or end walls of the container, to engage the upper edges of the corresponding walls of an underlying container when the containers are stacked in a deeply nested condition.
11. A container according to any one of the preceding claims, including channels or rebates on the underside of the base member, for engagement with the bars of an  
20 underlying container when the containers are stacked in a column stacked formation.
12. A container according to claim 11, wherein the support members include lugs that engage the channels or rebates of an overlying container when the containers are stacked in a column stacked formation.
- 25 13. An open-topped container substantially as described herein with reference to and as illustrated by the accompanying drawings.



INVESTOR IN PEOPLE

Application No: GB 0109970.4  
Claims searched: 1-13

10

Examiner: Darren Williams  
Date of search: 11 October 2001

## Patents Act 1977 Search Report under Section 17

### Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): B8P (PU)

Int Cl (Ed.7): B65D 21/06

Other: Online: JAPIO, WPI, EPODOC

### Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2263689 A (LIN PAC) see whole document	1-3, 7-10
X	GB 2296009 A (MCKECHNIE) see line 21 of page 8 to line 6 of page 9	1-3, 7-10
X	US 4573577 (MILLER) see whole document	1-4, 7-10

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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